

The anterior margin of the pronotum at each side bears three long, backward-curving spines. Near the posterior margin there is a row of eight shorter spines. There are also several very short spines on the disk. On the dorsum of both the second and third thoracic segments is a pair of spines. The dorsal side of each of the first seven abdominal segments bears a transverse row of four spines (Pl. XXII, fig. 4). The spines of the outer row are much longer and dark brown at the tips. The ninth segment terminates in a pair of long, large cerci nearly 3.5 mm. long. In the pupal chamber the pupa normally rests venter downward, resting on the large curving spines of the pronotum and the cerci. On turning over it rests on the dorsal spines of the abdomen and thorax, so that the tender pupa is never brought directly in contact with the soil.

DESCRIPTIONS OF FOUR NEW TABANIDÆ, WITH  
REMARKS UPON *CHRYSOPS CURSIM*.

BY C. P. WHITNEY, MILFORD, N. H.

***Tabanus birdiei*, n. sp.**

*Female*—Length 14-17 mm. Face white, densely covered with white hairs. Palpi yellow, slender, sparsely clothed with short hairs, extreme tip infuscated. Antennæ: two basal joints and base of third reddish yellow. Upper extremity of first joint black and covered with short black hairs. Third joint with upper angle rectangular or even obtuse, the joint beyond angle black. Eyes naked, purple with two green bands. Front wide, parallel, reddish brown, densely covered by white pollen and scattered erect black hairs. Callus prominent, shining brown, nearly square with a short, stout, tapering prolongation above. Thoracic dorsum brown with strongly marked white lines. Abdomen brown and white, the latter predominating and occupying the posterior margins of the segments, expanding into three rows of triangular spots. Venter yellowish, covered with white pollen. Legs tawny, tips of tibiæ and tarsi infuscated. Wings hyaline, large distinct clouds on cross-veins, divarication of third vein and at extremity of anal cell. First posterior cell somewhat coarctate.

Nine females, March and April, West Palm Beach, Fla. Named in remembrance of a young friend to whose kind assistance I am indebted for many fine specimens of Tabanidæ.

October, 1914.

In "Insects of Florida," recently published by Prof. C. W. Johnson, two of the above-described specimens captured in 1912 are mentioned as *cymatophorus* O. S. from which *birdiei* differs by its smaller size, clearer wings, wider front, nearly square callus, and shape of third antennal joint.

***Tabanus milleri*, n. sp.**

*Female*—Length  $8\frac{1}{2}$ -10 mm. Palpi white, with a slight yellowish tinge. Face covered by long white hairs. Antennæ fulvous, upper angle of third joint obtuse, annuli hardly infuscated. Front coarctate, dark yellow, sometimes almost black; no ocellar tubercle. Callus nearly black, rectangular, a line above. Eyes naked, dark green with a purple reflection and one distinct very dark purple band.

Thorax brown, with the usual lighter stripes. Abdomen black, segment margins yellowish white, expanding into three rows of spots, the medial row consisting mostly of white hairs, the lateral spots frequently fulvous, oblique and extending outward basally. Venter fuscous, margins white. Legs pale yellow, distal half of front tibiae and tarsi black, the other legs less infuscated. Wings hyaline, stigma pale yellow, first posterior cell broadly open.

Dedicated to two young friends whose kindly services furnished me a large number of desirable *Tabani*.

A comparison of twenty *milleri* captured in Florida, at Mianii, St. Augustine and St. Petersburg, with a great number of *sparus*, taken in New Hampshire, affords no constant separating character except the invariably well-defined eye band in this new species. *Sparus* has no band, only a purple reflection. *Pumilus* has two bands, also other distinct differences.

***Tabanus beatificus*, n. sp.**

*Female*—Length 15 mm. Antennæ black, third joint reddish at base, upper angle rectangular. Face, cheeks and palpi black. Front black, shining, callus transverse, protuberant. Connected above is a roundish convex spot extending across the front and nearly surrounded by light gray pollen. Vertex notched. Eyes naked, purple with three green bands. Thorax black, the gray lines scarcely perceptible. Abdomen black, densely covered with

appressed black hairs, except that laterally on the first three segments the hairs are white, forming broad, continuous grayish stripes of equal width with the median interspace. The fourth segment has traces of these stripes in narrow lateral and posterior fringes. Venter and legs very dark brown. Wings dark fuliginous, first posterior cell slightly coarctate.

One specimen received with other Florida Tabani from Rev. Geo. D. Hulst.

### **Chrysops ultimus, n. sp.**

*Female*—Length  $6\frac{1}{2}$  mm. Face yellow, callosities and palpi black. Antennæ slender, reddish at base, becoming black apically. Front yellowish pollinose, callosity and ocellar region black. Thorax black, with two greenish median stripes, a bright yellow one just above the wings and two below. Scutellum, abdomen and venter black; an obsolete median dorsal stripe. Legs yellow; joints, distal half of tibiæ and tarsi infuscated. Wings: root, costal cell, cross-band and apical spot black. First basal cell completely infuscated, second hyaline. The cross-band is convex outwardly, almost reaching the divarication of the third vein and fills the fourth posterior cell. The fifth is semi-infuscate. The apical spot fills the second sub-marginal cell, except a dot at base, and crosses the first posterior. The hyaline triangle is very narrow, but crosses brokenly the marginal cell to the costa.

Taken at West Palm Beach, Florida, April 18th.

### **Chrysops cursim.**

This species was described in the "Can. Ent." for 1879, Vol. II, Page 36.

In "Kansas Acad. of Science," Vol. X (1885-6) Prof. Williston, never having seen the species, remarks, "I do not see wherein this species differs from *C. pudicus* O. S." Presumably upon that authority *cursim* is placed in the "Tabanidæ of the World" as a synonym of *pudicus*.

Although no topotypes of *cursim* have been taken, the species has been found in several localities in New Jersey and Penn., and recognized, notably by Mr. Erich Daecke, who states he has never found intergrades of the two species. A specimen now in the collection of the Boston Soc. of Nat. Hist. was captured by Prof. A. P. Morse at West Peabody, Mass., July 13, 1911.

In comparison, *pudicus* may be said to have a black abdomen with yellow markings and *cursim* a yellow abdomen with black markings. The wing picture of *cursim* is as irregular as that of *delicatulus* and lighter coloured, while that of *pudicus* is dark and well defined.

### THREE NEW SPECIES OF ODONATA.\*

BY HORTENSE BUTLER, ITHACA, N. Y.

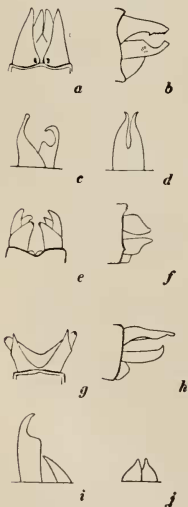
This paper contains the descriptions of three new species of dragonflies which were found while working over the material in the Cornell University collection, in the course of the preparation of a handbook of North American dragonflies.

#### *Ophiogomphus sequoiarum*, n. sp.

Total length ♂, 49 mm.; abdomen 34 mm.; hind wing 29 mm.

Total length ♀, 51 mm.; abdomen 34 mm.; hind wing 29 mm.

Face and occiput yellowish green, vertex dark brown, with paler transverse oval spot. Prothorax brown, with double median yellow spot on dorsum. Thorax olive green; on the dorsum a moderate stripe of dark brown, contracted on the collar; humeral and antehumeral stripes of dark brown, confluent above, with a narrow dividing line of olive green. Sides of thorax olive green, with a very narrow brown line on the last suture. Abdomen brownish, with hastate yellowish spots on dorsum of segments 1-9; dorsum of segment 10 more broadly yellow; sides of segments 1 and 2 inferiorly yellow, including the auricles; 8 and 9 also yellowish, excepting extreme margin of 8 apically. Legs dark brown, basal three-fourths of femora yellowish and studded with short, dark spines. Appendages yellowish (figs. a and b). Wings hyaline, costa indistinctly paler, stigma black.



a-d—*Ophiogomphus sequoiarum*.  
e-f—*Nehalennia carlotta*.  
g-j—*Gomphus abditus*.